

## CLAIMS

1. A radiolabeled mammalian tachykinin peptide analogue comprising a tachykinin peptide labeled with a  $^{99m}\text{Tc}$  isotope ( $^{99m}\text{Tc}$ -tachykinin peptide) and which has a half-life *in vivo* of  
5 at least 30 minutes, preferably a half-life *in vivo* is of at least 1 hour, more preferably a half-life *in vivo* is of at least 3 hours, and most preferably a half-life *in vivo* is of at least 5 hours.
2. The tachykinin peptide analogue of claim 1, wherein the tachykinin peptide is selected from the group consisting of: a neurokinin A peptide; a neurokinin B peptide; a neuropeptide K (a N terminally extended form of neurokinin A); a neuropeptide Y (a N terminally extended  
10 form of neurokinin A); and preferably a substance P (SP) peptide.
3. The tachykinin analogue of claims 1 or 2, wherein the analogue is capable of performing a specific binding in the salivary glands of a mice of at least 0.35% injected dose per gram organ (%ID/g), expressed as the difference in tissue uptake (90 minutes uptake) between untreated mice and mice treated with 90 nmol of a non-radioactive tachykinin peptide.
- 15 4. The tachykinin analogue of claims 3, wherein the analogue is capable of performing a specific binding in the salivary glands of a mice of at least 0.45% injected dose per gram organ (%ID/g); more preferably wherein the analogue is capable of performing a specific binding in the salivary glands of a mice of at least 0.55% injected dose per gram organ (%ID/g).
5. The tachykinin analogue of claims 3 or 4, wherein the tachykinin peptide is a substance P (SP) peptide.  
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6. The tachykinin peptide analogue of any of claims 1-5, wherein the tachykinin peptide comprises the C-terminal amino acid sequence, -Phe-X-Gly-Leu-Met-NH<sub>2</sub>, where X represents either Phe, Ile, or Val (SEQ ID NO 1).
7. The tachykinin peptide analogue of any of claims 1-6, wherein the tachykinin peptide is a  
25 substance P (SP) peptide consisting essential of the amino acid sequence Arg-Pro-Lys-Pro-Gln-Gln-Phe-Phe-Gly-Leu-Met-NH<sub>2</sub> (SEQ ID NO 2).
8. The radiolabeled tachykinin analogue of any of claims 1-7, wherein the  $^{99m}\text{Tc}$  isotope is labeled to the tachykinin peptide through a linking molecule situated between the tachykinin peptide and the  $^{99m}\text{Tc}$  isotope.
- 30 9. The radiolabeled tachykinin analogue of claim 8, wherein the linking molecule is a 1-imino-4-mercaptobutyl molecule.

10. The radiolabeled tachykinin analogue of claim 8, wherein the linking molecule is a DTPA molecule.
11. The radiolabeled tachykinin analogue of claim of claim 8, wherein the linking molecule is a 3-(p-Hydroxyphenyl)propinyl molecule.
- 5 12. Use of a radiolabeled tachykinin analogue of any of claims 1-11 for mammalian *in vivo* tachykinin peptide receptor imaging.
13. The use of claim 12, wherein the tachykinin receptor is a neurokinin 1 receptor expressed by arterioles and/or venules located in the submucosa, muscularis mucosa, external longitudinal muscle, and/or serosa.
- 10 14. The use of claim 13, wherein the tachykinin peptide is a substance P (SP) peptide.
15. The use of claim 12, wherein the tachykinin receptor is a neurokinin 2 receptor and wherein the tachykinin peptide is a neurokinin A peptide.
16. The use of claim 12, wherein the tachykinin receptor is a neurokinin 3 receptor and wherein the tachykinin peptide is a neurokinin B peptide.
- 15 17. The use of any of claims 12-16, wherein the *in vivo* tachykinin receptor imaging is done *in vivo* in a human.
18. The use of claim 17, wherein the human *in vivo* tachykinin receptor imaging is done in order to measure a specific amount of a tachykinin receptor situated *in vivo* on a human cell.
19. The use of claim 18, wherein the human cell is a human cell selected from the group consisting of a tumor cell, a T-lymphocyte cell, a thymus cell, a neoplasm cell, a monocyte cell,  
20 and a mast cell.
20. The use of claim 19, wherein tachykinin receptor is a neurokinin 1 receptor and wherein the tachykinin peptide is a substance P (SP) peptide.
21. The use of any of claims 12-20, wherein the purpose of the tachykinin receptor imaging is a  
25 diagnostic purpose.
22. The use of claim 21, wherein the diagnostic purpose is a diagnostic relating to inflammation or a diagnostic relating to a tumor.
23. A diagnostic kit comprising a radiolabeled tachykinin analogue of any of claims 1-11 and which is suitable to be used in any of the uses of claims 12-22.